UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2002/00962

April 21, 2003

Mr. Fred P. Patron
Senior Transportation Planning Engineer
Federal Highway Administration, Oregon Division
530 Center Street NE
Salem, OR 97301

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Act Essential Fish Habitat Consultation for Isthmus Slough (Coos City) Bridge Replacement Project, Coos County, Oregon

Dear Mr. Patron:

Enclosed is the biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the effects of funding the proposed Isthmus Slough (Coos City) Bridge Replacement Project in Coos County, Oregon. In this Opinion, NOAA Fisheries concludes that the proposed action is not likely to jeopardize the continued existence of ESA-listed Oregon Coast coho salmon *(Oncorhynchus kisutch)*. As required by section 7 of the ESA, NOAA Fisheries includes reasonable and prudent measures with nondiscretionary terms and conditions that NOAA Fisheries believes are necessary to minimize the potential for incidental take associated with this action.

This document also serves as consultation on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and its implementing regulations (50 CFR part 600).

If you have any questions regarding this consultation, please contact Jim Collins of my staff in the Oregon Habitat Branch at 541.957.3389.

Sincerely,

for Michael R Course

D. Robert Lohn
Regional Administrator

cc: Molly Cary, ODOT
Ken Franklin, ODOT
John Raasch, ODOT

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Isthmus Slough (Coos City) Bridge Replacement Project
Coos County, Oregon

Agency:	Federal Highway Administration
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	April 21, 2003
Issued by:	for Michael R Crouse _____ D. Robert Lohn Regional Administrator
Refer to:	**2002/00962**

TABLE OF CONTENTS

1. INTRODUCTION

1.1 Background

On August 7, 2002, NOAA's National Marine Fisheries Service (NOAA Fisheries) received a biological assessment (BA) and a request from the Federal Highway Administration (FHWA) for Endangered Species Act (ESA) section 7 formal consultation for the Isthmus Slough (Coos City) Bridge Replacement Project. On October 9, 2002, NOAA Fisheries sent a letter to FHWA requesting additional information regarding project details and potential environmental impacts. This additional information was received by NOAA Fisheries February 12, 2003. The Oregon Department of Transportation (ODOT) proposes replacement of the bridge, which crosses Isthmus Slough near the town of Coos Bay, Oregon. This biological opinion (Opinion) is based on the information presented in the BA and discussions with the applicant.

The FHWA determined that Oregon Coast (OC) coho salmon (*Oncorhynchus kisutch*) may occur within the project area. OC coho salmon were listed as threatened under the ESA on August 10, 1998 (63 FR 42587), and protective regulations were issued under section 4(d) of the ESA on July 10, 2000 (65 FR 42422). The FHWA, using methods described in *Making ESA Determinations of Effect for Individual or Grouped Actions at the Watershed Scale* (NMFS 1996), determined that the proposed action is likely to adversely affect OC coho salmon.

This Opinion is based on the information presented in the BA and developed through correspondence to obtain additional information and clarity. The objective of this Opinion is to determine whether the actions to remove the existing structure and construct a new structure are likely to jeopardize the continued existence of OC coho salmon. This consultation is undertaken under section 7(a)(2) of the ESA, and its implementing regulations, 50 CFR Part 402.

1.2 Proposed Action

1.2.1 Project Purpose

This project is designed to replace the Isthmus Slough bridge, which crosses over Isthmus Slough. The existing steel bridge is 209 meters (m) long, with twenty-four spans, and was built in 1955. The entire structure is supported on timber piles. The Coos City-Sumner Road Bridge crosses Isthmus Slough, connecting Highway 101 to rural residences, a public golf course, a log and chip mill, approximately 0.3 kilometers (km) to the east, and access to the Coos Bay Wagon Road.

Inspections of the bridge revealed that the timber piles supporting the bridge have deteriorated to the point of needing replacement. In addition, the bridge has narrow travel lanes and substandard sidewalks. The bridge is posted with load restrictions of 24, 31, and 29 tons, depending on the number of axles. The proposed project includes removing the existing structure and replacing it with a four-span concrete bridge in the existing alignment.

1.2.2 Temporary Work Bridge

A temporary work bridge across the slough would be required to construct the new bridge. In addition to the main work bridge, the contractor will likely need a wider section of work bridge at the three new interior footing locations. The work bridge will consist of driven steel piles, pile caps, girders and decking. Due to the very soft soil, piles could be driven as deep as 27 m below the mudline. The work bridge span lengths would be approximately 7.6 m. Pilings would most likely be steel H-piles or steel pipe piles with a dimension ranging from 254 to 635 millimeters (mm). An estimated 150 driven piles would be required to support the work bridge. Once the piles are driven, they would be cut off at the required elevation, and a steel cap connected to the top of the piles. The beams and decking would then be placed to finish the work bridge. The deck of the work bridge would be sealed to prevent any pollutants from potentially entering the waterway. This construction could be started at the east or west bank, and will work across the slough, one span at a time, with the crane sitting on the previously completed span.

1.2.3 Temporary Partial Detour Bridge

To construct the new bridge on an alignment that meets current Federal safety requirements for curvature and to construct it as close to the existing bridge corridor as possible, a portion of the existing bridge will need to be removed and a temporary partial detour constructed. The construction of the partial detour bridge will be similar to the temporary work bridge. It is estimated that approximately 85 piles will be required to construct the partial detour.

1.2.4 New Bridge Construction

Due to Isthmus Slough being tidally influenced, all interior bent foundations would be regularly inundated, if not completely underwater at all times. All interior bent foundations would be constructed below the mean high high water (MHHW) elevation, and would require coffer dams with concrete seals to keep the work area dry and to isolate uncured concrete from coming in contact with the slough during footing construction. The end bents (Bents 1 and 5), which are above the MHHW line on the banks of Isthmus Slough, should only require temporary shoring to keep excavations from encroaching on the permitted in-water work area. Bents 2, 3, and 4 would require coffer dams and seals that would extend approximately 13.7 m below the MHHW elevation.

The coffer dams for Bents 2, 3, and 4 will be approximately 10 m by 12 m each, and will consist of steel sheet piles driven around the perimeter of the footing construction area to the required depth below the bottom of the seal to provide stability of the sheet pile. It is anticipated that the coffer dam sheet piles would need to be driven to the underlying sandstone layers. Steel bracing inside the coffer dam sheet piles would likely need to be used for stability of the sheet piling due to the soft soil layers.

Bents 1 and 5 would likely consist of a single or double row of steel pipe piles 457 to 610 mm in diameter, with a concrete pile cap and concrete wingwalls. The first step would include

constructing temporary shoring, most likely steel sheet pile. The pile cap would then be formed and poured, followed by the concrete wingwalls. Finally, the abutment would be backfilled and the temporary shoring removed. No riprap is required for scour protection of the end bents.

Once the coffer dams for the interior bents (bents 2, 3, and 4) are constructed, the area inside the coffer dam would be excavated to the required elevation for the concrete seal. The top layers of the excavated slough soil would be retained and used to cover the constructed footings to provide habitat for shellfish. The remaining excavated soil would be collected and disposed of off site. Footing piles are driven after the excavation is completed. Once all piles are driven for a footing, a concrete seal is placed using a tremie pour, which uses a pipe to place the concrete underwater. After the concrete seal has cured, the water inside the coffer dam that was in contact with the green concrete would be pumped out and treated in an approved manner, leaving a dry working area for construction of the footing and column. Once the footing and column is constructed to an elevation above the MHHW elevation (where superstructure construction can take place out of the water), the coffer dam would be flooded, and the steel sheet piles removed. No riprap would be required for scour protection of the interior bents.

The next step will be building the falsework for the new concrete box girder bridge. Span lengths for the falsework would be approximately 7.6 m, resulting in about 120 driven steel piles. Cap beams and decking would then be constructed. The decking would provide the bottom of the forms for the cast-in-place box girder.

The superstructure of the new bridge would consist of a cast-in-place, post-tensioned concrete box girder. This type of construction allows for longer spans, thereby reducing the number of permanent piers. Once the falsework piles, cap beams, and decking are constructed, the forms are built so that the reinforcing steel can be placed and the concrete can be poured. The box girder concrete would be placed in three separate sections: The bottom slab, the longitudinal and transverse stems, and the top deck. The structure is then post-tensioned longitudinally and the ducts grouted. After the post-tensioning is complete, the falsework will be removed. All pilings would be removed using a vibratory hammer.

1.2.5 Bridge Removal

The remainder of the existing bridge and the partial detour bridge would be removed after traffic is transferred onto the new bridge. It is anticipated that the removal operation would take place during the in-water period of October 1, 2006, to February 15, 2007. Bridge removal would include removing the existing steel truss and the steel lift span and concrete approaches in smaller pieces so that they can be dismantled and hauled off site. All debris would be contained from entering the waterway. Once the deck is removed, a vibratory hammer would be used to extract the existing timber piles.

The work bridge will be removed after the new bridge construction activities are complete. It is anticipated that this removal would take place during the in-water period of October 1, 2006, to February 15, 2007. The work bridge would likely be removed one span at a time, working from

the east end to the west end. Steel piles would be pulled using a vibratory hammer. Similar to the existing bridge removal, the work bridge removal will require that all debris is contained, to prevent any from entering the waterway.

1.2.6 Stormwater Collection and Treatment

Currently, all stormwater drains directly from the bridge into Isthmus Slough with no detention or treatment. The project would direct the runoff into vegetated ditches on both ends of the new bridge. These ditches should provide adequate detention and infiltration to improve existing site conditions.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

2.1.1 Biological Information

Within the Coos watershed, NOAA Fisheries listed the OC coho salmon as threatened under the ESA on August 10, 1998 (63 FR 42587). Protective regulations were issued under section 4(d) of the ESA on July 10, 2000 (65 FR 42422).

OC coho salmon are known to spawn and rear in the Coos watershed. Adult coho salmon enter the Coos River in late September and spawn from October through January, with the majority of spawning activity occurring in smaller, low gradient tributaries. Coho salmon use the Coos Estuary within the project area primarily as a migration corridor and for juvenile rearing. The downstream migration of coho salmon smolts typically occurs from early February through May, but may extend into June. Due to location of the project in the Coos Estuary, OC coho salmon are not expected to be within the project area during the ODFW in-water work period (October 1 to February 15).

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR Part 402 (the consultation regulations). NOAA Fisheries must determine whether the action is likely to jeopardize the listed species. This analysis involves the definition of the biological requirements and current status of the listed species, and the evaluation of the relevance of the environmental baseline to the species' current status.

Subsequently, NOAA Fisheries evaluates whether the action is likely to jeopardize the listed species by determining if the species can be expected to survive with an adequate potential for recovery. In making this determination, NOAA Fisheries must consider the estimated level of mortality attributable to: (1) Collective effects of the proposed or continuing action; (2) the environmental baseline; and (3) any cumulative effects. This evaluation must take into account

measures for survival and recovery specific to the listed salmonid's life stages that occur beyond the action area. If NOAA Fisheries finds that the action is likely to jeopardize the listed species, NOAA Fisheries must identify reasonable and prudent alternatives for the action. For the proposed action, NOAA Fisheries' jeopardy analysis considers direct or indirect mortality of fish attributable to the action.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed coho salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species, taking into account population size, trends, distribution and genetic diversity. To assess the current status of the listed species, NOAA Fisheries starts with the determinations made in its decision to list OC coho salmon for ESA protection and also considers new available data that is relevant to the determination.

The relevant biological requirements are those necessary for OC coho salmon to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance their capacity to adapt to various environmental conditions, and allow them to become self-sustaining in the natural environment.

For this consultation, the biological requirements are improved habitat characteristics that function to support successful migration and holding in the action area. The current status of the OC coho salmon, based upon their risk of extinction, has not significantly improved since the species was listed. The Isthmus Slough estuary serves as an adult and juvenile migration corridor, as well as juvenile rearing habitat.

2.1.4 Environmental Baseline

The current range-wide status of the identified ESU may be found in Nickelson *et al.* (1992) and Weitkamp *et. al* (1995). The identified action would occur within the range of OC coho salmon. The action area is the area that is directly and indirectly affected by the action. The direct effects occur at the project site, and may extend upstream or downstream based on the potential for impairing fish passage, hydraulics, sediment and pollutant discharge, and the extent of riparian habitat modifications. Indirect effects may occur throughout the watershed where actions described in this Opinion lead to additional activities or affect ecological functions contributing to stream degradation. As such, the action area for the proposed activity includes the immediate area where the Isthmus Slough Bridge Replacement Project would occur, and those areas

upstream and downstream that may reasonably be affected, temporarily or in the long term. For the purposes of this Opinion, the action area is defined as the channel and adjacent riparian areas for approximately 500 m upstream and downstream of the project site. Temporary indirect effects (disruption of primary productivity and food resources), and potential direct effects (sediment, pollutant discharge and hydraulics) to Isthmus Slough would be caused by the in-water work.

The Coos Bay Estuary, of which Isthmus Slough is a bifurcation, is the second largest estuary in Oregon. It is approximately 13,300 acres in size (Cortright *et al.* 1987), averaging nearly 1 km wide by 24 km long. The bay has approximately 30 tributaries. The major tributary into Coos Bay is the Coos River, which joins the bay approximately 7.5 km east of the project site. The Coos Bay Estuary is classified as a drowned river mouth-type estuary, where winter flows discharge high volumes of sediment through the estuary. In summer, when discharge is lower, seawater inflow dominates this type of estuary. Extensive filling and diking of Coos Bay and its sloughs, estuaries, and tributaries have changed the form and function of the estuary. Approximately 90% of Coos Bay marshes have been permanently lost to dikes and landfills (Proctor *et al*.1980). Approximately 72,000 tons of sediment, mainly silts and clays, pour into the Coos Bay Estuary every year (Schultz 1990).

Based on the best available information regarding the current status of OC coho salmon range-wide, the population status, trends, genetics, and the poor environmental baseline conditions within the action area, NOAA Fisheries concludes that the biological requirements of OC coho salmon are not currently being met. Degraded habitat, resulting from agricultural practices, forestry practices, road building, and residential construction indicate that many aquatic habitat indicators are not properly functioning within the Coos watershed. Actions that do not maintain or restore properly functioning aquatic habitat conditions would be likely to jeopardize the continued existence of OC coho salmon.

2.1.5 Analysis of Effects

2.1.5.1 Effects of Proposed Action

The following proposed actions have the potential to impact OC coho salmon:

Construction Equipment

Accidental release of fuel, oil, and other contaminants may occur. Operation of back-hoes, excavators, cranes, and other equipment requires the use of fuels, lubricants, *etc.*, which, if spilled into a waterbody channel, or into the adjacent riparian zone, can injure or kill aquatic organisms. Petroleum-based contaminants (such as fuel, oil, and some hydraulic fluids) contain poly-cyclic aromatic hydrocarbons (PAHs), which can be acutely toxic to salmonids at high levels of exposure and can also cause chronic lethal and acute and chronic sublethal effects to aquatic organisms (Neff 1985). Similarly, exposure to herbicides can have lethal and sublethal effects on salmonids, aquatic invertebrates, aquatic vegetation, and both target and non-target

riparian vegetation (Spence *et al.* 1996). To minimize the potential of pollutants entering the waterway, construction equipment, materials and refueling would be staged at least 45 m from the MHHT (mean high high tide).

Pile Installation and Removal

NOAA Fisheries expects that there will be short-term effects to OC coho salmon resulting from installation of the proposed piles and containment structure. Timing of the pile installation and removal will occur during the designated in-water work period. The short-term effects associated with pile installation will be: (1) Increases in sedimentation and turbidity; (2) loss of benthic habitats; and (3) displacement of coho salmon. Long-term spatial and temporal effects may include changes in hydraulics and channel geometry, loss of benthic resources, and disruption of salmonid migration patterns. Additionally, these effects may reduce light penetration and inhibit primary production in the estuary, depending on the intensity of the effect.

Contaminated Water

Contaminated water will be generated from the construction of the proposed scour protection. Additionally, untreated stormwater runoff from the barge will be directly imported into the Isthmus Slough and Coos Estuary. Contaminated water, especially water with a high or low pH, has the potential to injure or kill fish. Contaminated water is defined as water with an increase in turbidity that is equal to or greater than 10% of background levels and/or water with a pH greater than or less than one point of background levels. Contaminated water from the barge use will be minimal in relation to the estuary, and is not expected to have a measurable impact. Untreated stormwater runoff is not expected, in quantifiable terms, to adversely affect OC coho salmon.

Water Quality Stormwater Effects

Due to an increase in new impervious surface, the potential exists for an increase in runoff from impervious surfaces. However, the proposed stormwater runoff treatment criteria would offset any potential adverse effects to water quality as a result of the proposed action. The proposed stormwater treatment stated within the BA would require all stormwater to be routed to the end of the bridges, where it would be treated in a manner that would likely result in a decrease of pollutants to Isthmus Slough.

Sedimentation

Potential sedimentation impacts to OC coho salmon from the proposed actions include both direct and indirect effects. Potential direct effects include mortality from exposure to suspended sediments (turbidity) and contaminants resulting from construction. Potential indirect effects include behavioral changes resulting from elevated turbidity levels (Sigler *et al.* 1984, Berg and Whitman *et al.* 1982, Gregory 1988).

The influences of suspended sediment and turbidity to fish reported in the literature range from beneficial to detrimental. Elevated total suspended solids (TSS) conditions have been reported to enhance cover conditions, reduce piscivorus fish/bird predation rates, and improve survival. Elevated TSS conditions have also been reported to cause physiological stress, reduce growth,

and adversely affect survival. Of key importance in considering the detrimental effects of TSS on fish is the frequency and the duration of the exposure, not just the TSS concentration.

Behavioral avoidance of turbid waters by salmonids may be one of the most important effects of suspended sediments (DeVore *et al.* 1980, Scannell 1988). Salmonids have been observed to move laterally and downstream to avoid turbidity plumes (Sigler *et al.* 1984, Lloyd 1987, Scannell 1988). Juvenile salmonids tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, unless the fish need to traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a documented positive effect is providing refuge and cover from predation (Gregory and Levings 1998).

Fish that remain in turbid, or elevated TSS, waters experience a reduction in predation from piscivorus fish and birds (Gregory and Levings 1998). In systems with intense predation pressure, this provides a beneficial trade off (*e.g.*, enhanced survival) to the cost of potential physical effects (*e.g.*, reduced growth). Turbidity levels of about 23 Nephalometric Turbidity Units (NTU) have been found to minimize bird and fish predation risks (Gregory 1993). Exposure duration is a critical determinant of the occurrence and importance of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonids have evolved in systems that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with flood events, and are adapted to such high pulse exposures. Adult and larger juvenile salmonids may be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, research shows that chronic exposure can cause physiological stress responses that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Turbidity, at moderate levels, has the potential to adversely affect primary and secondary productivity, and at high levels, has the potential to injure and kill adult and juvenile fish, and may also interfere with feeding (Spence *et al.* 1996). Newly emerged salmonid fry may be vulnerable to even moderate amounts of turbidity (Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill-flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine, redeposited sediments also have the potential to adversely affect primary and secondary productivity (Spence *et al.* 1996), and to reduce incubation success (Bell 1991) and cover for juvenile salmonids (Bjornn and Reiser 1991). Because the potential for turbidity should be localized and brief, and the potential for fish presence is minimal, the probability of direct mortality is negligible.

Construction-related effects necessary to complete the proposed action would be minimized by implementation of effective erosion and pollution control measures, and completing all work within the MHHT during the ODFW approved in-water work period.

Stream Hydraulics
The placement of fill material below the MHHT would typically result in simplification of habitat and increased stream velocities under the structure. However, the small increase of fill over the existing conditions in relation to the size of the slough at the site of the bridge crossing is negligible, so hydraulics are not expected to be affected.

Work Area Isolation and Fish Removal
Construction of the new bridge footings will require work area isolation from the flowing water. Fish removal activities will be in accordance with NOAA Fisheries' fish handling guidelines. Any ESA-listed fish removed from the isolated work area will experience high stress with the possibility of up to a 5% delayed mortality rate, depending on the rescue method.

Work area isolation can result in a loss of aquatic invertebrates due to dewatering or changes in water quality within the contained area. In addition, sediment-laden water created within isolated work areas could escape, resulting in impacts to the aquatic environment downstream of the project site.

The adverse effects of these activities on OC coho salmon and their riparian and aquatic habitats will be avoided or minimized by carrying out the conservation measures and construction approaches described in the BA (pages 19-31).

2.1.6 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation." The action area is defined as Isthmus Slough, 500 m upstream and downstream of the Isthmus Slough Bridge.

Many actions occur within the Coos watershed, and within the action area itself. Non-Federal activities within the action area are expected to increase with a projected 34% increase in human population over the next 25 years in Oregon (Oregon Department of Administrative Services 1999). Thus, NOAA Fisheries assumes that future private and state actions would continue within the action area, but at increasingly higher levels as population density increases. NOAA Fisheries assumes that future FHWA transportation projects in the Coos watershed would be reviewed through separate section 7 consultation processes and therefore are not considered cumulative effects.

2.1.7 Conclusion

NOAA Fisheries determines that, when the effects of the FHWA's proposed action (funding the Isthmus Slough Bridge Replacement Project) are added to the environmental baseline and cumulative effects occurring in the action area, they are not likely to jeopardize the continued existence of OC coho salmon. These conclusions are based on the following considerations:

(1) All in-water work and other construction activities within the MHHT elevation would take place according to the ODFW in-water work period to protect fish and wildlife resources; (2) work area isolation (including use of NOAA Fisheries' guidelines for proper fish handling) and other conservation measures will be in place to avoid or minimize adverse affects to water quality; (3) removal of the existing Isthmus Slough Bridge piers will open approximately 17.6 square miles, resulting in a 3.7 square mile net increase of habitat area; and (4) disturbance to tidally-influenced mudflats resulting from the pile replacement will be minimized by completing the work from the existing bridge and work bridge. Therefore, the proposed action is not expected to prevent or delay the achievement of properly functioning habitat conditions within the action area.

2.1.8 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat is designated that may be affected by the action. In instances where the amount or extent of authorized incidental take is exceeded, any operations causing such take must cease pending reinitiation of consultation.

2.2 Incidental Take Statement

Section 9 and rules promulgated under section 4(d) of the ESA prohibit any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in any such conduct) of listed species without a specific permit or exemption. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, and sheltering. "Harass" is defined as actions that create the likelihood of injuring listed species by annoying it to such an extent as to significantly alter normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. "Incidental take" is take of listed animal species that results from, but is not the purpose of, the Federal agency or the applicant carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to, and not intended as part of, the agency action is not considered prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

2.2.1 Amount and Extent of the Take

NOAA Fisheries anticipates that the action covered by this Opinion is reasonably certain to result in incidental take of OC coho salmon because of detrimental effects from sediment pulses, increased pollutant levels, and the slight possibility of juvenile presence in the vicinity of the project site during in-water work. NOAA Fisheries expects the possibility exists for incidental

take of up to 20 juvenile coho salmon during work area isolation and handling of fish. Take resulting from the effects of other project actions covered by this Opinion is largely unquantifiable in the short term, and not expected to be measurable in the long term. The extent of the take is limited to the action area.

2.2.2 Reasonable and Prudent Measures

The measures described below are non-discretionary. They must be implemented so that they become binding conditions in order for the exemption in section 7(a)(2) to apply. The FHWA has the continuing duty to regulate the activities covered in this incidental take statement. If the FHWA fails to require ODOT to adhere to the terms and conditions of the incidental take statement through enforceable terms added to the document authorizing this action, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

The Isthmus Slough Bridge Replacement Project includes a set of "conservation measures" designed to minimize take of ESA-listed species. These are described on pages 19 to 31 of the August 7, 2002, BA. Specific measures for in-water and bank work, clearing and grubbing, bridge rehabilitation, erosion control, hazardous materials, and site-specific conservation and habitat remediation measures are also included.

NOAA Fisheries believes that the following reasonable and prudent measures, along with the conservation measures described in the BA, are necessary and appropriate to minimize the likelihood of take of ESA-listed fish resulting from implementation of this Opinion. These reasonable and prudent measures would also minimize adverse effects to designated critical habitat.

The FHWA shall:

1. Minimize the likelihood of incidental take by limiting in-water work as necessary to avoid harming vulnerable salmon life stages, including migration and rearing.

2. Minimize the likelihood of incidental take from in-water work by ensuring that in-water work areas are isolated from flowing water.

3. Minimize the amount and extent of incidental take from construction activities in or near the waterway through development and implementation of effective erosion and pollution control measures throughout the area of disturbance and for the life of the project.

4. Minimize the amount and extent of take from loss of instream habitat and impacts to critical habitat by implementing measures to minimize impacts to riparian and instream habitat, or where impacts are unavoidable, to replace or restore lost riparian and instream functions.

5. Minimize the amount and extent of take from stormwater impacts and altered stream hydraulics by implementing measures to treat water and limit fill within the 100-year floodplain.

6. Ensure that temporary and permanent impacts to the riparian and instream habitat are restored and mitigated.

7. Ensure effectiveness of implementation of reasonable and prudent measures, fish handling, erosion control measures, and plantings for site restoration, through monitoring and evaluation both during and following construction.

2.2.3 Terms and Conditions

To be exempt from the prohibitions of section 9 of the ESA, the FHWA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above for each category of activity. These terms and conditions are non-discretionary.

1. To implement reasonable and prudent measure #1 (in-water timing and minimizing the extent of in-water work), the FHWA shall ensure that:

    a. Construction impacts will be confined to the minimum area necessary to complete the project.
        i. Survey and mark the MHHT at the project site before commencement of work.
        ii. All work within the active channel that could potentially contribute sediment or toxicants to downstream fish-bearing streams will be completed within the ODFW in-water work period (October 1 to February 15).
    b. Extensions of the in-water work period, including those for work outside the wetted perimeter of the stream but below the MHHT, must have the written concurrence of a biologist from NOAA Fisheries.
    c. Coos County will arrange a pre-construction meeting with NOAA Fisheries and the contractor before commencement of project activities.
    d. Coos County shall notify NOAA Fisheries at least one week before the start of work below the MHHT.

2. To implement reasonable and prudent measure #2 (isolation of in-water work area and proper fish handling methods), the FHWA shall ensure that the work area is well isolated from the active flowing stream within a coffer dam (*e.g.* sandbags, sheet pilings, inflatable bags), or similar structure, to minimize the potential for sediment entrainment. The FHWA shall also ensure that during fish capture and salvage proper fish handling techniques will be practiced.

a. During in-water work (work within the MHHT), if the project involves either significant channel disturbance or use of equipment within the wetted channel, ensure that the work area is well isolated from the active flowing stream within a coffer dam (constructed of sand bags, sheet pilings, inflatable bags, *etc.*) or similar structure, to minimize the potential for sediment entrainment. Furthermore, no ground- or substrate-disturbing action will occur within the MHHT 45 m upstream of potential spawning habitat as measured at the thalweg without isolation of the work area from flowing waters. After the coffer dam is in place, any fish trapped in the isolation pool will be removed by a permitted ODOT and/or ODFW biologist before de-watering, using ODFW-approved methods.

i. All coffer dams will be of sufficient height to not be inundated during high flows.

ii. Any water intake structure authorized under this Opinion must have a fish screen installed, and operated and maintained in accordance with NOAA Fisheries' fish screen criteria.

(1) Water pumped from the work isolation area will be discharged into an upland area providing over-ground flow before returning to the creek. Discharge will occur so that it does not cause erosion.

(2) Discharges into potential fish spawning areas or areas with submerged vegetation are prohibited.

iii. Fish Salvage.

(1) Before and intermittently during pumping, attempts will be made to salvage and release fish from the work isolation area as is prudent to minimize risk of injury. If fish salvaging requires the use of seine equipment to capture fish, it must be accomplished as follows:

(a) Seining will be conducted by or under the supervision of a fishery biologist experienced in such efforts and all staff working with the seining operation must have the necessary knowledge, skills, and abilities to ensure the safe handling of all ESA-listed fish.

(b) ESA-listed fish must be handled with extreme care and kept in water to the maximum extent possible during seining and transfer procedures. The transfer of ESA-listed fish must be conducted using a sanctuary net that holds water during transfer, whenever necessary to prevent the added stress of an out-of-water transfer.

(c) Seined fish must be released as near as possible to capture sites.

(d) The transfer of any ESA-listed fish from the applicant to third-parties other than NOAA Fisheries personnel requires written approval from NOAA Fisheries.

(e) The applicant must obtain any other Federal, state, and local permits and authorizations necessary for the conduct of the seining activities.

(f) The applicant must allow NOAA Fisheries, or its designated representative, to accompany field personnel during the seining activity, and allow such representative to inspect the applicant's seining records and facilities.

(g) A description of any seine-and-release effort will be included in a post-project report, including the name and address of the supervisory fish biologist, methods used to isolate the work area and minimize disturbances to ESA-listed species, stream conditions before and following placement and removal of barriers, the means of fish removal, the number of fish removed by species, the condition of all fish released, and any incidence of observed injury or mortality.

(2) If fish salvaging requires the use of electrofishing equipment to capture fish, it must be accomplished as follows (NMFS 1998):

(a) Electrofishing may not occur in the vicinity of listed adults in spawning condition or in the vicinity of redds containing eggs.

(b) Equipment must be in good working condition. Operators must go through the manufacturer's preseason checks, adhere to all provisions, and record major maintenance work in a log.

(c) A crew leader having at least 100 hours of electrofishing experience in the field using similar equipment must train the crew. The crew leader's experience must be documented and available for confirmation, and such documentation may be in the form of a logbook. The training must occur before an inexperienced crew begins any electrofishing, and must be conducted in waters without listed fish.

(d) Measure conductivity and set voltage as follows:

Conductivity (umhos/cm)	Voltage
Less than 100	900 to 1100
100 to 300	500 to 800
Greater than 300	150 to 400

(e) Direct current (DC) must be used at all times.

(f) Each session must begin with pulse width and rate set to the minimum needed to capture fish. These settings should be gradually increased only to the point where fish are immobilized and captured. Start with pulse width of 500us

and do not exceed five milliseconds. Pulse rate should start at 30Hz and work carefully upwards. In general, pulse rate should not exceed 40 Hz, to avoid unnecessary injury to the fish.

(g) The zone of potential fish injury is 0.5 m from the anode. Care should be taken in shallow waters, undercut banks, or where fish can be concentrated because in such areas the fish are more likely to come into close contact with the anode.

(h) The monitoring area must be worked systematically, moving the anode continuously in a herringbone pattern through the water. Do not electrofish one area for an extended period.

(i) Crew must carefully observe the condition of the sampled fish. Dark bands on the body and longer recovery times are signs of injury or handling stress. When such signs are noted, the settings for the electrofishing unit may need adjusting. Sampling must be terminated if injuries occur or abnormally long recovery times persist.

(j) Whenever possible, a block net must be placed below the area being sampled to capture stunned fish that may drift downstream.

(k) The electrofishing settings must be recorded in a logbook along with conductivity, temperature, and other variables affecting efficiency. These notes, together with observations on fish condition, will improve technique and form the basis for training new operators.

iv. Fish Passage. Passage shall be provided for both adult and juvenile forms of salmonid species throughout the construction period. The FHWA/ODOT will ensure passage of fish as per ORS 498.268 and ORS 509.605 (Oregon's fish passage guidance).

3. To implement reasonable and prudent measure #3 (erosion and pollution control), FHWA will ensure that:

a. The Contractor will develop and implement a site-specific spill prevention, containment, and control plan (SPCCP), and is responsible for containment and removal of any toxicants released. The Contractor will be monitored by the ODOT Engineer to ensure compliance with this SPCCP.

b. Material removed during excavation will only be placed in locations where it cannot enter streams, wetlands, or other waterbodies.

c. During excavation, native streambed materials will be stockpiled above the bankfull elevation for later use.

d. The following erosion and pollution control materials are onsite:

i. A supply of erosion control materials (*e.g.*, silt fence and straw bales) is on hand to respond to sediment emergencies. Sterile straw or hay bales will be used when available to prevent introduction of weeds.

ii. An oil-absorbing, floating boom is available on-site during all phases of construction. The boom must be of sufficient length to span the wetted channel.

iii. All temporary erosion controls (*e.g.*, straw bales, silt fences) are in-place and appropriately installed downslope of project activities within the riparian area. Effective erosion control measures will be in-place at all times during the contract, and will remain and be maintained until such time that permanent erosion control measures are effective.

e. All exposed or disturbed areas will be stabilized to prevent erosion.

i. Areas of bare soil within 45 m of waterways, wetlands or other sensitive areas will be stabilized by native seeding[1], mulching, and placement of erosion control blankets and mats, if applicable, but within 14 days of exposure.

ii. All other areas will be stabilized quickly as reasonable, but within 14 days of exposure.

iii. Seeding outside of the growing season will not be considered adequate nor permanent stabilization.

f. All erosion control devices will be inspected during construction to ensure that they are working adequately.

i. Erosion control devices will be inspected daily during the rainy season, weekly during the dry season, monthly on inactive sites.

ii. If inspection shows that the erosion controls are ineffective, work crews will be mobilized immediately, during working and off-hours, to make repairs, install replacements, or install additional controls as necessary.

iii. Erosion control measures will be judged ineffective when turbidity plumes are evident in waters occupied by listed salmonids during any part of the year.

g. If soil erosion and sediment resulting from construction activities is not effectively controlled, the engineer will limit the amount of disturbed area to that which can be adequately controlled.

h. Sediment will be removed from sediment controls once it has reached 1/3 of the exposed height of the control. Whenever straw bales are used, they will be staked and dug into the ground 12 centimeters (cm). Catch basins will be maintained so that no more than 15 cm of sediment depth accumulates within traps or sumps.

i. Sediment-laden water created by construction activity will be filtered before it leaves the right-of-way or enters a stream or other waterbody. Silt fences or other

---

[1] By Executive Order 13112 (February 3, 1999), Federal agencies are not authorized to permit, fund or carry out actions that are likely to cause, or promote, the introduction or spread of invasive species. Therefore, only native vegetation that is indigenous to the project vicinity, or the region of the state where the project is, shall be used.

detention methods will be installed as close as reasonable to culvert outlets to reduce the amount of sediment entering aquatic systems.

j. Any hazardous materials spill will be reported to NOAA Fisheries.
   i. In the event of a hazardous materials or petrochemical spill, immediate action shall be taken to recovery toxic materials from further impacting aquatic or riparian resources.
   ii. In the event of a hazardous materials or petrochemical spill, a detailed description of the quantity, type, source, reason for the spill, and actions taken to recover materials will be documented. The documentation should include photographs.

k. The work bridges will have containment measures in place that minimizes any potential of petrochemicals or hazardous materials from entering the river.
   i. The decking of the work bridge shall be constructed to self-contain petrochemicals and hazardous materials.
   ii. The work bridges and the containment structure will be maintained to preserve containment integrity throughout the term of the project.

l. Refueling and hazardous materials.
   i. All staging and refueling shall occur at least 45 m from the MHHT, except as stated below.
      (1) Fuel storage locations within 45 m of the MHHT shall have containment measures in place that meets or exceeds 100% containment.
      (2) No auxiliary fuel tanks are stored within 45 m of the MHHT.
   ii. Hazardous materials stored within 45 m of the MHHT shall have containment measures in place that meets or exceeds 100% containment.
   iii. No hazardous materials will be stored on the work bridge.

4. To implement reasonable and prudent measure #4 (minimize loss of instream habitat), FHWA will ensure that:

   a. The distance between existing bridge approach fill and the 100-year flood plain or MHHT (whichever is closer to the existing fill) will not be reduced.
   b. The amount of fill within the flood plain will be minimized.
   c. Boundaries of the clearing limits associated with site access and construction will be flagged to prevent ground disturbance of riparian vegetation, wetlands, and other sensitive sites beyond the flagged boundary.
   d. During excavation, native streambed material will be stockpiled out of the two-year flood plain for later use in back-filling the trenches used to construct coffer dams.
   e. During project design Coos County will work to minimize the amount of riprap used. Where riprap is necessary, only clean, non-erodible, upland angular rock of sufficient size for long-term armoring will be employed. Riprap will not be "end-dumped" within the wetted channel.

f. Alteration or disturbance of stream banks and existing riparian vegetation will be minimized. Where bank work is necessary, bank protection material shall be placed to maintain normal waterway configuration whenever possible.

g. Temporary access roads will be designed as follows:
   i. Temporary access roads will not cross streams.
   ii. Alteration of existing native vegetation will be minimized in the construction, use, and maintenance of temporary access roads.
   iii. Existing roadways or travel paths will be used whenever reasonable.
   iv. Vehicles and machinery must cross riparian areas at right angles to the main channel wherever reasonable.
   v. Temporary roads within 45 m of streams will avoid, minimize and mitigate soil disturbance and compaction by clearing vegetation to ground level and placing clean gravel over geotextile fabric.
   vi. No treated wood may be used within or above the MHHT.

h. All project operations, except efforts to minimize storm or high flow erosion, will cease under high flow conditions that may result in inundation of the immediate work area.

i. Measures will be taken to prevent any debris from falling within the boundaries of the MHHT. Any material that falls within this area will be removed in a manner that has a minimum impact to the riparian area, streambed and water quality.

5. To implement reasonable and prudent measure # 5 (new impervious surface and stormwater management), above, the FHWA shall ensure that:

   a. All storm water runoff from any road or bridge built pursuant to a permit issued under this Opinion must be managed to ensure that it will not result in a change in the existing hydraulic conditions or an increase of pollutants to the receiving water.

   b. Any project that will produce new surfaces or land use conversions that retard the entry of water into the soil must control the quantity and quality of the resulting stormwater runoff for the life of the project.

   c. Stormwater must be infiltrated or dispersed onsite to the maximum extent possible without causing flooding or erosion impacts.

   d. When stormwater runoff must be discharged into a freshwater system, the following requirements apply:
      i. The area must be drained by a conveyance system comprised entirely of manufactured elements (*e.g.*, pipes, ditches, outfall protection) that extends to the MHHT of the receiving water.
      ii. Any erodible elements of this system must be adequately stabilized to prevent erosion.
      iii. Surface water from the area must not be diverted from or increased to an existing wetland, stream or near-shore habitat sufficient to cause a significant adverse effect.

iv. Runoff treatment facilities must be designed, built and maintained to collect runoff from the project site using the best available technology applicable to the site conditions. Treatment must be provided to remove debris, nutrients, sediment, petroleum hydrocarbons, metals and other pollutants likely to be present.

6. To implement reasonable and prudent measure #6 (site restoration and mitigation), the FHWA shall ensure that:

a. Site restoration and clean-up, including protection of bare earth by seeding, planting, mulching and fertilizing, is done in the following manner:
   i. All damaged areas will be restored to pre-work conditions, including restoration of original streambank lines and contours.
   ii. All exposed soil surfaces, including construction access roads and associated staging areas, will be stabilized at finished grade with mulch, native herbaceous seeding, and native woody vegetation.
      (1) Planting should occur between October 15 and March 15. Do not plant in freezing periods of weather.
      (2) On cut slopes steeper than 1 to 2, a tackified seed mulch will be used so that the seed does not wash away before germination and rooting occurs. In steep locations, a hydromulch will be applied at 1.5 times the normal rate.
   iii. Disturbed areas will be planted with native vegetation specific to the project vicinity or the region of the state where the project is, and will comprise a diverse assemblage of woody and herbaceous species.
   iv. Plantings will be arranged randomly within the revegetation area.
   v. No herbicide application will occur within 90 m of any stream channel as part of this permitted action. Mechanical removal of undesired vegetation and root nodes is permitted.
   vi. No surface application of fertilizer will be used within 15 m of any stream channel as part of this permitted action.
   vii. Fencing will be installed as necessary to prevent access to revegetated sites by livestock or unauthorized persons.
   viii. Plantings will achieve 80% ground cover after five years.
      (1) If success standard has not been achieved after five years, the applicant will submit an alternative plan to the FHWA. The alternative plan will address temporal loss of function.

7. To implement reasonable and prudent measure #7 (monitoring and reporting), the FHWA shall ensure that:

a. Within 90 days of completing the project, the FHWA/ODOT will submit a monitoring report to NOAA Fisheries describing the success meeting their permit conditions. This report will consist of the following information:

i. Project identification.
   (1) Project name.
   (2) Starting and ending dates of work completed for this project.
   (3) The FHWA contact person.
   (4) Monitoring reports shall be submitted to:
   NOAA Fisheries
   Oregon State Branch, Habitat Conservation Division
   Attn: 2002/00962
   525 NE Oregon Street, Suite 500
   Portland, OR 97232-2778

ii. Isolation of in-water work area. A report of any fish salvage activity including:
   (1) The name and address of the supervisory fish biologist;
   (2) Methods used to isolate the work area and minimize disturbances to ESA-listed species;
   (3) Stream conditions before and following placement and removal of barriers;
   (4) The means of fish removal;
   (5) The number of fish removed by species;
   (6) The location and condition of all fish released; and
   (7) Any incidence of observed injury or mortality.

iii. Pollution and erosion control. Copies of pollution and erosion control inspection reports, including descriptions of any failures experienced with erosion control measures, efforts made to correct them and a description of any accidental spills of hazardous materials.

iv. Site restoration.
   Documentation of the following conditions:
   (1) Finished grade slopes and elevations.
   (2) Planting composition and density.
   (3) A plan to inspect and, if necessary, replace failed plantings for three years.

v. A narrative assessment of the project's effects on natural stream function.

vi. Photographic documentation of environmental conditions at the project site and compensatory mitigation site(s) (if any) before, during and after project completion.
   (1) Photographs will include general project location views and close-ups showing details of the project area and project, including pre and post construction.
   (2) Each photograph will be labeled with the date, time, photo point, project name, the name of the photographer, and a comment describing the photograph's subject.
   (3) Relevant habitat conditions include characteristics of channels, streambanks, riparian vegetation, flows, water quality, and other

visually discernable environmental conditions at the project area, and upstream and downstream of the project.

vii. Post construction impacts. The FHWA/ODOT shall assess the project's impacts, temporary and permanent, and compare them to the impacts assessed in the 2002 BA. This written assessment will be provided to NOAA Fisheries for review. If the actual impacts exceed those outlined in the BA then the FHWA/ODOT will provide additional mitigation to offset those impacts.

3. MAGNUSON-STEVENS ACT

3.1 Background

On August 7, 2002, NOAA Fisheries received a letter from FHWA requesting essential fish habitat (EFH) consultation pursuant to the MSA for the subject action. The objective of the EFH consultation is to determine whether the proposed action may adversely affect designated EFH for relevant species, and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH resulting from the proposed action. This consultation is undertaken pursuant to section 305(b) of the MSA and its implementing regulations (50 CFR 600).

3.2 Magnuson-Stevens Fishery Conservation and Management Act

The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), requires the inclusion of EFH descriptions in Federal fishery management plans. In addition, the MSA requires Federal agencies to consult with NOAA Fisheries on activities that may adversely affect EFH.

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting the definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.110).

Section 305(b) of the MSA (16 U.S.C. 1855(b)) requires that:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH.

- NOAA Fisheries shall provide conservation recommendations for any Federal or state activity that may adversely affect EFH.

- Federal agencies shall within 30 days after receiving conservation recommendations from NOAA Fisheries provide a detailed response in writing to NOAA Fisheries regarding the conservation recommendations. The response shall include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with the conservation recommendations of NOAA Fisheries, the Federal agency shall explain its reasons for not following the recommendations.

The MSA requires consultation for all actions that may adversely affect EFH, and does not distinguish between actions within EFH and actions outside EFH. Any reasonable attempt to encourage the conservation of EFH must take into account actions that occur outside EFH, such as upstream and up slope activities, that may have an adverse effect on EFH. Therefore, EFH consultation with NOAA Fisheries is required by Federal agencies undertaking, permitting or funding activities that may adversely affect EFH, regardless of its location.

3.3 Identification of EFH

The Pacific Fisheries Management Council (PFMC) has designated EFH for Federally-managed fisheries within the waters of Washington, Oregon, and California. The designated EFH for groundfish and coastal pelagic species encompasses all waters from the mean high water line, and upriver extent of saltwater intrusion in river mouths, along the coasts of Washington, Oregon and California, seaward to the boundary of the U.S. exclusive economic zone (370.4 km)(PFMC 1998a, 1998b). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other waterbodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC), and long-standing, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years) (PFMC 1999). In estuarine and marine areas, designated salmon EFH extends from the nearshore and tidal submerged environments within state territorial waters out to the full extent of the exclusive economic zone (370.4 km) offshore of Washington, Oregon, and California, north of Point Conception to the Canadian border.

Detailed descriptions and identifications of EFH for the groundfish species are found in the Final Environmental Assessment/Regulatory Impact Review for Amendment 11 to *The Pacific Coast Groundfish Management Plan* (PFMC 1998a) and the NMFS *Essential Fish Habitat for West Coast Groundfish Appendix* (Casillas *et al.* 1998). Detailed descriptions and identifications of EFH for the coastal pelagic species are found in Amendment 8 to the *Coastal Pelagic Species Fishery Management Plan* (PFMC 1998b). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the *Pacific Coast Salmon Plan* (PFMC 1999). Assessment of the potential adverse effects to these species' EFH from the proposed action is based on this information.

3.4 Proposed Action

The proposed actions are detailed in section 1.2. The action area is defined as Isthmus Slough, 500 m upstream and downstream of the Isthmus Slough Bridge. The Isthmus Slough area has been designated as EFH for various life stages of chinook salmon, coho salmon, coastal pelagic, and groundfish species (Table 1).

3.5 Effects of Proposed Action

The proposed action is reasonably certain to cause short-term degradation of EFH due to increases in total suspended solids, suspension and redistribution of potentially contaminated sediments, and temporary degradation of benthic habitat for macro invertebrates.

3.6 Conclusion

NOAA Fisheries believes that the proposed action will adversely affect EFH for Pacific salmon, coastal pelagic, and groundfish species.

3.7 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. The conservation recommendations outlined above in the BA (pages 19-31) and all of the reasonable and prudent measures and the terms and conditions contained in sections 2.2.2 and 2.2.3 are applicable to Pacific salmon, coastal pelagic, and ground fish species. Therefore, NOAA Fisheries incorporates each of those measures here as EFH conservation recommendations.

Table 1. Species with designated EFH found in waters of the State of Oregon.

Species	Adults	Spawning/ Mating	Eggs/ Parturition	Larvae	Juveniles/ Small Juveniles	Large Juveniles
Big Skate				NA		NA
California Skate	X	X	X	NA	X	NA
Longnose Skate				NA		NA
Leopard Shark[11]	X	X	X	NA	X	NA
Soupfin Shark	X	X	X	NA	X	NA
Spiny Dogfish	X		X	NA	X	X
Cabezon	X	X	X	X	X	X
Finescale Codling						NA
Kelp Greenling	X	X	X	X	X	X
Lingcod	X	X	X	X	X	X
Pacific Cod	X	X	X	X	X	NA
Pacific Rattail						NA
Pacific Whiting (Hake)	X	X	X	X	X	NA
Sablefish					X	
Spotted Ratfish	X	X		NA	X	NA
Arrowtooth Flounder						NA
Butter Sole						NA
Curlfin Sole						NA
Dover Sole						NA
English Sole	X	X	X	X	X	NA
Flathead Sole					X	NA
Pacific Sanddab	X		X	X	X	NA
Petrale Sole						NA
Rex Sole	X				X	NA
Rock Sole	X	X	X	X	X	NA
Sand Sole						NA
Starry Flounder	X	X	X	X	X	NA
Aurora Rockfish						
Bank Rockfish[11]						
Black Rockfish	X				X	
Black-and-yellow Rockfish[11]						
Blackgill Rockfish						
Blue Rockfish						
Bocaccio				X	X	
Brown Rockfish	X	X	X	X	X	NA
Canary Rockfish						
Chilipepper						
China Rockfish						NA
Copper Rockfish	X	X	X	X	X	X
Cowcod						NA

Species	Adults	Spawning/ Mating	Eggs/ Parturition	Larvae	Juveniles/ Small Juveniles	Large Juveniles
Darkblotched Rockfish						
Flag Rockfish						
Gopher Rockfish[11]						
Grass Rockfish[11]						NA
Greenspotted Rockfish						NA
Greenstriped Rockfish						NA
Harlequin Rockfish[22]						
Longspine Thornyhead						NA
Pacific Ocean Perch						
Pink Rockfish[11]						
Quillback Rockfish	X	X	X	X	X	X
Redbanded Rockfish						NA
Redstripe Rockfish						NA
Rosethorn Rockfish						NA
Rosy Rockfish						NA
Rougheye Rockfish						NA
Sharpchin Rockfish						NA
Shortbelly Rockfish						
Shortraker Rockfish						NA
Shortspine Thornyhead						NA
Silverygray Rockfish						NA
Speckled Rockfish[11]						NA
Splitnose Rockfish						NA
Squarespot Rockfish[11]						NA
Stripetail Rockfish						NA
Tiger Rockfish						NA
Vermilion Rockfish						NA
Widow Rockfish						
Yelloweye Rockfish						NA
Yellowmouth Rockfish						NA
Yellowtail Rockfish						

Table Legend:

X = The EFH for the particular species and life stage occurs within the EFH composite in Oregon.

Blank = The EFH for the particular species and life stage is not currently known to occur within the EFH composite in Oregon, or insufficient information is currently available to identify its EFH.

NA = Not applicable.

[1]absent from northern Oregon; [2]absent from southern Oregon

3.8 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920(j) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation

recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate or offset the adverse impacts of the activity on EFH. If the response is inconsistent with a conservation recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.9 Supplemental Consultation

The FHWA must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

4. LITERATURE CITED

Section 7(a)(2) of the ESA requires biological opinions to be based on "the best scientific and commercial data available." This section identifies the data used in developing this Opinion.

Bell, M.C. 1991. Fisheries handbook of Engineering requirements and biological criteria. Fish Passage Development and Evaluation Program. U.S. Army Corps of Engineers. North Pacific Division.

Berg, L. and T.G. Northcote. 1985. "Changes In Territorial, Gill-Flaring, and Feeding Behavior in Juvenile Coho Salmon (Oncorhynchus kisutch) Following Short-Term Pulses of Suspended Sediment." Canadian Journal of Fisheries and Aquatic Sciences 42: 1410-1417.

Bjornn, T.C., and D.W. Reiser. 1991. Habitat requirements of salmonids in streams. Pages 83-138 *in* W.R. Meehan, ed. Influences of forest and rangeland management on salmonid fishes and their habitats. American Fisheries Society Special Publication 19:83-138.

Casillas, E., L. Crockett, Y. deReynier, J. Glock, M. Helvey, B. Meyer, C. Schmitt, M. Yoklavich, A. Bailey, B. Chao, B. Johnson and T. Pepperell. 1988. Essential Fish Habitat West Coast Groundfish Appendix. National Marine Fisheries Service. Montlake, Washington. 778 p.

Cortright, R., J. Weber and R. Bailey. 1987. *The Oregon estuary plan book*. Department of Land Conservation and Development. Salem, Ore.

DeVore, P. W., L. T. Brooke, and W. A. Swenson. 1980. "The Effects of Red Clay Turbidity and Sedimentation on Aquatic Life In the Nemadji River System. Impact of Nonpoint Pollution Control on Western Lake Superior." S. C. Andrews, R. G. Christensen, and C. D. Wilson. Washington, D.C., U.S. Environmental Protection Agency. EPA Report 905/9-79-002-B.

Gregory, R. S. 1988. Effects of Turbidity on benthic foraging and predation risk in juvenile chinook salmon. Pages 64-73 *In:* C. A. Simenstad (ed.) Effects of dredging on anadromous Pacific coast fishes. Washington Sea Grant Program. Washington State University. Seattle, Washington.

Gregory, R. S., and C. D. Levings. 1998. "Turbidity Reduces Predation on Migrating Juvenile Pacific Salmon." Transactions of the American Fisheries Society 127: 275-285.

Lloyd, D. S. 1987. Turbidity as a Water Quality Standard for Salmonid Habitats in Alaska. North American Journal of Fisheries Management 7:34-45.

Neff, J.M. 1985. Polycyclic aromatic hydrocarbons. Pages 416-454 in G.M. Rand and S.R. Petrocelli. Fundamentals of aquatic toxicology,. Hemisphere Publishing, Washington, D.C.

Nickelson, T.E., J. W. Nicholas, A.M. McGie, R.B. Lindsay, D.L. Bottom, R.J. Kaiser, and S.E. Jacobs. 1992. Status of anadromous salmonids in Oregon coastal basins. Unpublished manuscript. Oregon Department of Fish and Wildlife, Research and Development Section, Corvallis, and Ocean Salmon Management, Newport. 83 pages.

NMFS (National Marine Fisheries Service). Guidelines for Electrofishing Waters Containing Salmonids Listed Under the Endangered Species Act. 2000. Protected Resources Division, Portland, Oregon, 5 pp.

NMFS (National Marine Fisheries Service). Making Endangered Species Act determinations of effect for individual and grouped actions at the watershed scale. Habitat Conservation Program, Portland, Oregon, 32 p.

PFMC (Pacific Fishery Management Council), 1998a. Final Environmental Assessment/Regulatory Review for Amendment 11 to the Pacific Coast Groundfish Fishery Management Plan. October 1998.

PFMC (Pacific Fishery Management Council), 1998b. The Coastal Pelagic Species Fishery Management Plan: Amendment 8. December 1998.

PFMC (Pacific Fishery Management Council). 1999. *Amendment 14 to the Pacific Coast Salmon Plan*. Appendix A: Description and Identification of Essential Fish Habitat, Adverse Impacts and Recommended Conservation Measures for Salmon. Portland, Oregon.

Proctor, C. M., C. Garcia, D. V. Galvin, G. B. Lewis and L. C. Loehr. 1980. *An ecological characterization of the Pacific Northwest coastal region*. U.S. Fish and Wildlife Service. FWS/OBS-79/15.

Redding, J. M., C. B. Schreck, and F. H. Everest. 1987. "Physiological Effects on Coho Salmon and Steelhead of Exposure to Suspended Solids." Transactions of the American Fisheries Society 116: 737-744.

Rosgen, Dave. 1996. "Applied River Morphology". Wildland Hydrology. Chapter 6, pp. 26-32.

Scannell, P.O. 1988. Effects of Elevated Sediment Levels from Placer Mining on Survival and Behavior of Immature Arctic Grayling. Alaska Cooperative Fishery Unit, University of Alaska. Unit Contribution 27.

Servizi, J. A., and Martens, D. W. 1991. “Effects of Temperature, Season, and Fish Size on Acute Lethality of Suspended Sediments to Coho Salmon”. Canadian Journal of Fisheries and Aquatic Sciences 49:1389-1395.

Schultz, S. T. 1990. The northwest coast: A natural history. Timber Press, Inc. Portland, Ore.

Spence, B.C., G.A. Lomnicky, R.M. Hughes, and R.P. Novitzki. 1996. An Ecosystem Approach to Salmonid Conservation. TR-4501-96-6057.

Weitkamp, L.A., T.C. Wainwright, G.J. Bryant, G.B. Milner, D.J. Teel, R.G. Kope, and R.S. Waples. 1995. Status review of coho salmon from Washington, Oregon and California. National Marine Fisheries Service, Northwest Fisheries Science Center, Seattle, Washington.